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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/338,035	06/22/1999	HENRY ESMOND BUTTERWORTH	GB919990026US1	9863

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EXAMINER

TANG, KENNETH

ART UNIT PAPER NUMBER

2195

DATE MAILED: 04/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/338,035

Applicant(s)

BUTTERWORTH, HENRY
ESMOND

Examiner

Kenneth Tang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/29/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is in response to the Amendment on 11/19/04. Applicant's arguments have been fully considered but they are now moot in view of the new grounds of rejections.
2. Claims 1-18 are presented for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The following is indefinite:

- i. In claim 1, "tasks of the same type" (line 10) is indefinite because only "tasks of different types" have been defined (line 3). If tasks of different types are only defined, tasks of the same type does not exist. It is unclear whether the Applicant intended to refer to the different type. The Examiner recommends defining and introducing a tasks of a same type.
- ii. In claim 1, "task type" (line 3) is indefinite because it is not made explicitly clear whether this refers to the different type (line 3) or the same type (line 10). The Examiner recommends designating whether this task type is of a different type or of a same type.
- iii. Claims 8 and 9 are rejected for the same indefinite reasons as above.

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- b. The following lacks antecedent basis:
 - iv. Claim 1, Line 10, "the same task type"
 - v. Claim 8, Line 11, "the same task type"
 - vi. Claim 9, Line 11, "the same task type"

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 6-9, 11-13, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfieri (US 5,745,778) in view of Nguyen et al. (hereinafter Nguyen) (US 5,778,434).

5. As to claim 1, Alfieri teaches a method and system for processing tasks in a data processing system including a microprocessor and an instruction cache wherein tasks of different types are defined in the system, each task type having code associated therewith, the task being by loading the associated code into the instruction cache for execution on the microprocessor, the method comprising the step of placing the tasks of the same task type into a batch (*col. 2, lines 60-67, col. 3, lines 1-7, col. 4, lines 18-22, Fig. 5B, see Abstract*). As stated above, Alfieri teaches grouping tasks/threads into a batch but fails to explicitly teach that the tasks in a batch

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are processed before processing the next ordered task. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the system of Alfieri process the task/thread groups before a single thread/task because Alfieri teaches that processing within groups is faster than single operations that cross group boundaries (*col. 3, lines 5-7*).

6. Alfieri fails to explicitly teach tasks being processed out of sequential order. However, Nguyen teaches a queue (batch) that hold the same identifier that processes tasks out of sequential order. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the feature of a queue (batch) that hold the same identifier that processes tasks out of sequential order to the existing data batch processing system of Alfieri because this would optimize efficiency of data processing (*see Abstract and col. 2, lines 39-67*).

7. As to claim 2, Alfieri teaches wherein the code associated with at least one type of task fits within the instruction cache, the method comprises the further steps of: processing such a task by loading the associated code on the microprocessor, and, on a determination that there is a further task of like type in the batch, executing the loaded code to process the further task (*col. 3, lines 29-37 and Abstract*).

8. As to claim 6, Alfieri teaches wherein a task is placed in a batch at the time the task is scheduled (*col. 4, lines 18-22*).

9. As to claim 7, Alfieri teaches wherein the tasks are managed as a queue (*Fig. 5C*).

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10. As to claim 8, it is rejected for the same reasons as stated in the rejection of claim 1. In addition, Nguyen teaches using a scheduler to schedule the tasks (*col. 2, lines 14-26*).

11. As to claim 9, it is rejected for the same reasons as stated in the rejection of claim 8.

12. As to claim 11, it is rejected for the same reasons as stated in the rejection of claim 8. In addition, Alfieri teaches batching the new task to the cached task after determining that it has a "like type" (see rejection of claim 8). However, Alfieri fails to explicitly teach that the caching consist when it has the same code (instead of "like type"). However, "Official Notice" is taken that both the concept and advantages of providing that memory caching of the same code or instructions is well known and expected in the art. Memory caching is effective and beneficial because most programs access the same data or instructions over and over. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include memory caching of the same code or instructions to the existing system of Alfieri in order to obtain the benefits mentioned above.

13. As to claim 12, Alfieri fails to explicitly teach adding the new task to the end of the queue if the task queue does not include the cached task that requires the same code to process the cached task as the new task. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the feature of adding the new task to the end of the queue if the task queue does not include the cached task that requires the same code to

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process the cached task as the new task because it is not desired and at the same time, efficiency is increased by maintaining the group of tasks with substantially the same code.

14. As to claim 13, it is rejected for the same reasons as stated in the rejection of claim 2.

15. As to claims 15-17, they are rejected for the same reasons as stated in the rejection of claims 11-13.

16. **Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfieri (US 5,745,778) in view of Nguyen et al. (hereinafter Nguyen) (US 5,778,434), and further in view of Kirk (US 5,875,464).**

17. As to claim 3, Alfieri and Nguyen fail to explicitly teach the code being logically divided at one or more break points into two or more portions and responding to a break point defined within a first portion of the code to schedule a further task for future execution of a second portion of the code. However, Kirk teaches the code being logically divided at one or more break points into two or more portions (*col 17, lines 55-57*) and responding to a break point defined within a first portion of the code to schedule a further task for future execution of a second portion of the code (*col 23 lines 64-67 and col 24, lines 1-5, and Fig. 13*). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the

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feature of creating and responding breakpoints and to resume from them to the system of Alfieri and Nguyen because it provides for load balancing which increases the efficiency.

18. As to claim 4, it is rejected for the same reasons as stated in the rejection of claim 3.

19. **Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Alfieri (US 5,745,778) in view of Nguyen et al. (hereinafter Nguyen) (US 5,778,434), in view of Kirk (US 5,875,464), and further in view of Nilsen (US 6,438,573).**

20. As to claim 5, Alfieri and Kirk fail to explicitly teach having each portion of code define an atomic operation. However, Nilsen “shows a code fragment which describes an atomic segment of code” (*col 4, lines 32-33*). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the feature of atomicity to the existing system of Alfieri for the reason of making the system more reliable. Atomicity is beneficial because it assures that the operation follows through completely and accurately or not at all.

21. **Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Alfieri (US 5,745,778) in view of Nguyen et al. (hereinafter Nguyen) (US 5,778,434), and further view of Bourekas (US 6,128,703).**

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22. As to claim 10, Alfieri and Nguyen fail to explicitly teach having the microprocessor and cache embodied on a single chip. However, from the reference of Bourekas, it is shown that it is common knowledge for a data processing apparatus to have the microprocessor and cache embodied on a single chip (*col 1, lines 61-63*). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the feature of the CPU and cache on a single chip to increase the convenience.

23. **Claims 14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfieri (US 5,745,778) in view of Nguyen et al. (hereinafter Nguyen) (US 5,778,434), and further view of Nilsen (US 6,438,573).**

24. As to claim 14, Alfieri and Nguyen fail to explicitly teach having each portion of code define an atomic operation. However, Nilsen “shows a code fragment which describes an atomic segment of code” (*col 4, lines 32-33*). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the feature of atomicity to the existing system of Alfieri for the reason of making the system more reliable. Atomicity is beneficial because it assures that the operation follows through completely and accurately or not at all.

25. As to claim 18, it is rejected for the same reasons as stated in the rejection of claim 14.

Response to Arguments

26. *Applicant arguments (regarding claims 11, 13, 15, 17, 1, 2, 8, and 9) are based on the same limitation. Applicant argues that Alfieri's thread group does not relate to grouping threads according to common code processing, but rather according to common data processing. And because this limitation is not taught, a prima facie case for obviousness cannot be made.*

In response, the Examiner respectfully disagrees. The broadest reasonable interpretation of a thread can be an instruction, while computer code is computer instructions for a computer. Therefore, the broadest reasonable interpretation of a group of common threads is that it relates to common computer code processing. During patent examination, the pending claims must be "given their broadest reasonable interpretation consistent with the specification." *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969).

27. In response to applicant's argument in claim 15 that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "an operation to determine if a thread should be a member of an existing thread group") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

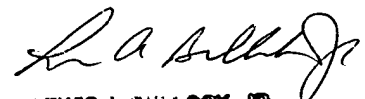
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth Tang whose telephone number is (571) 272-3772. The examiner can normally be reached on 8:30AM - 6:00PM, Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kt
4/12/05


LEWIS A. BULLOCK, JR.
PRIMARY EXAMINER